

AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraph beginning at page 3, line 4, and continuing to page 3, line 6, as follows:

For all channels except HSDPA channels the RNC decides when to transmit data. This means that interference cannot be avoided in node B in those cases where the UEs are in the same direction, i.e. in the same cell segment.

Please amend the caption on page 3, line 12 as follows:

SUMMARYDISCLOSURE OF INVENTION

Please amend the paragraph beginning at page 4, line 1, and continuing to page 4, line 8, as follows:

An advantage of the technology disclosed herein invention is that the intracell and or intercell interference is minimised which leads to that less power is needed when the base station BS transmits data to a user equipment UE, so called down link, or when a UE transmits data to a BS, so called uplink. A further advantage is that this will lead also to less interference in the network, which in turn leads to that the total data throughput in the network can be raised. Here, intercell interference refers to the interference between a number of cells and intracell interference refers to the interference within the cell.

Please amend the paragraph beginning at page 4, line 26, and continuing to page 4, line 30, as follows:

The technology disclosed herein invention is preferably used in a data transmission such as the previously known HSDPA, but may also be used in a different system where data (preferably data packets) is communicated between user equipments and base stations. However, in order to further explain the technology disclosed herein invention references are made to an HSDPA system.

Please amend the paragraph beginning at page 5, line 5, and continuing to page 5, line 17, as follows:

There is a new HSDPA transmission every time slot. This corresponds to a High Speed-Time Transport Time Interval (HS-TTI) of 2 ms. The technology disclosed herein~~invention~~ refers to time slots and in HSDPA system the time slot refers to the Transport Time Interval (TTI). The technology disclosed herein~~invention~~ is not restricted to a time slot of 2 ms, but may use another time interval.

According to the technology disclosed herein~~invention~~ the scheduler divides the cell into the cell segments on the basis of preferably the intracell interference determined by the scheduler by using the spatial information about where each user equipment is situated in the cell. Preferably, the scheduler according to the technology disclosed herein~~invention~~ divides the cell into cell segments on the basis of an optimum regarding, for example, transmission rates etc, and/or the minimum intercell and intracell interference.

Please amend the paragraph beginning at page 5, line 27, and continuing to page 6, line 2, as follows:

According to the technology disclosed herein~~invention~~ the scheduler preferably allots the time slots to the user equipments on the basis of intracell and/or intercell interference determined by the scheduler by using the spatial information about where each user equipment is situated in the cell. Preferably, the scheduler allots the time slots on the basis of an optimum regarding, for example, transmission rates etc, and/or the minimum intercell and intracell interference.

Please amend the paragraph beginning at page 6, line 14, and continuing to page 6, line 16, as follows:

A scheduler according to technology disclosed herein~~the invention~~ that considers the arising intracell interference and which scheduler can decide when to transmit data to a UE, gives a transmission scheme as follows:

Please amend the paragraph beginning at page 6, line 21, and continuing to page 6, line 23, as follows:

Thus, according to one example embodiment ~~of the invention~~ only one user equipment in each cell segment is allotted to the first time slot such that the antenna system sends information to only one user equipment in each cell segment.

Please amend the paragraph beginning at page 6, line 29, and continuing to page 7, line 3, as follows:

However, in another example embodiment ~~of the invention~~, a number of UEs (i.e. a subset of UEs) in the same cell segment are allotted to the same time slot as a number of UEs in another cell segment. For example two user equipments in at least the first cell segment are allotted to the same time slot. This situation is not as optimal as allotting only one UE per cell segment, but still gives a reduced intracell interference compared to allotting an even greater number of UEs.

Please amend the paragraph beginning at page 8, line 10, and continuing to page 8, line 16, as follows:

According to this example embodiment ~~of the invention~~ the scheduler divides both the first cell and the second cell into the cell segments on the basis of intracell and/or intercell interference determined by the scheduler by using the spatial information about where each UE is situated in the different cells. Preferably, the scheduler divides the cell into cell segments on the basis of an optimum regarding, for example, transmission rates etc, and/or the minimum intercell and intracell interference.

Please amend the paragraphs beginning at page 9, line 4, and continuing to page 9, line 20, as follows:

An advantage of this example embodiment of the invention is that both the intracell and intercell interference is minimised which leads to less power being needed when transmitting data to a user equipment UE. A further advantage is that this will lead also to less interference in the network, which in turn leads to that the total data throughput in the network can be raised.

According to one example embodiment of the invention, the antenna system comprises an adaptive antenna transmitting into each cell segment using beam forming functions.

According to one example embodiment of the invention the scheduler uses the direction of arrival (DOA) in order to identify the position of the user equipments. This technique is well known from prior art.

Furthermore, the technology disclosed herein invention uses a chronological time slot sequence in order for the antenna system to simultaneously transmit to all user equipments in the system allotted to the same time slot.

Please amend the paragraph beginning at page 10, line 4, and continuing to page 10, line 5, as follows:

Below the HSDPA will be explained further as an example of how a data transmission system according to the technology disclosed herein invention may be structured.

Please amend the paragraph beginning at page 12, line 13, and continuing to page 12, line 15, as follows:

Fig. 1 schematically shows an arrangement according to an example embodiment of the invention where two cells, each comprising four user equipments, is managed by a base station;

Please add the following two new paragraphs on page 12, after line 25:

Fig. 5 is a flowchart showing basic acts or steps of a method performed when a scheduler manages at least a first cell according to an example embodiment.

Fig. 6 is a flowchart showing basic acts or steps of a method performed when a scheduler also manages a second cell according to an example embodiment.

Please amend the caption on page 13, line 27, as follows:

DETAILED DESCRIPTION~~MODE FOR CARRYING OUT THE INVENTION~~

Please amend the paragraph beginning at page 12, line 28, and continuing to page 13, line 4, as follows:

Fig. 1 schematically shows an arrangement according to an example embodiment~~the invention~~, where a first cell 1 is managed by a base station BS. The first cell 1 comprises four user equipments UE1, UE2, UE3 and UE4. The base station BS comprises an adaptive antenna (shown in Fig. 2 denoted Tx) arranged to send out a signal in a more preferred direction covering one or more cell segment CS. In figure 1 the antenna Tx (Fig. 2) sends information in the first cell 1 into two cell segments CS1 and CS2. In cell segment CS1 user equipment UE1 and UE2 are present and in cell segment CS2 user equipments UE 3 and UE4 are present.

Please amend the paragraph beginning at page 13, line 6, and continuing to page 13, line 13, as follows:

Fig. 1 also shows that a second cell 6 is managed by the base station BS. The second cell 6 comprises four user equipments UE1, UE2, UE3 and UE4. The adaptive antenna (shown in Fig. 2 denoted Tx) is arranged to send out a signal in a preferred direction covering one or more cell segment CS1, CS2 also in the second cell. In figure 1 the antenna Tx sends information in the second cell 6 into two cell segments CS1 and CS2. In cell segment CS1 user equipment UE1 and UE2 are present and in cell segment CS2 user equipments UE 3 and UE4 are present.

Please add the following two new paragraphs on page 16, after line 20:

Fig. 5 shows basic acts or steps of a method performed when a scheduler manages at least a first cell according to an example embodiment. Act 5-1 shows the first base station receiving information from the user equipments in the first cell by means of the first antenna system. Act 5-2 shows the act of communicating the information to the scheduler. Act 5-3 shows the scheduler identifying each user equipment in the first cell. Act 5-4 shows the scheduler identifying in which cell segment each user is positioned. Act 5-5 shows the scheduler allotting a first time slot to at least one user equipment in a first cell segment in the first cell. Act 5-6 shows the scheduler allotting the first time slot also to at least one user equipment in a second cell segment in the first cell. Act 5-7 shows the first antenna system sending information from the base station simultaneously to all user equipments allotted to the first time slot.

Fig. 6 shows basic acts or steps of a method performed when the scheduler also manages a second cell according to an example embodiment. Act 6-1 shows the first base station or the second base station receiving information from the user equipments in the second cell, by means of the first antenna system or the second antenna system. Act 6-2 shows the first base station or the second base station communicating the information to the scheduler. Act 6-3 shows the scheduler identifying each user equipment in the second cell. Act 6-4 shows the scheduler identifying in which cell segment each user equipment is positioned. Act 6-5 shows the scheduler allotting the first time slot to at least one user equipment in a first cell segment in the second cell.